UNION CARBIDE CHEMICALS AND PLASTICS

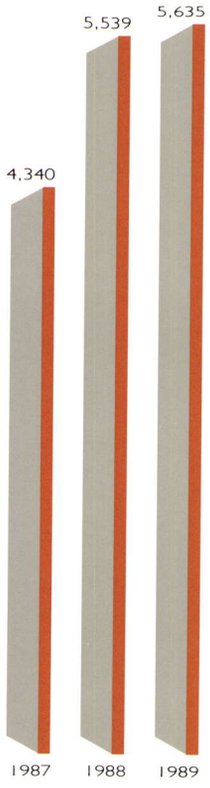
1989 SUMMARY ANNUAL REPORT

ON THE COVER:
Another link in the quality chain . . . Truck driver Charles Poteet at our Garland, Tex., latex plant begins a further quality check on the product even as it is loaded into a delivery tank. It's all part of a continuous chain of quality controls applied from the time the latex is made until the time it is delivered.

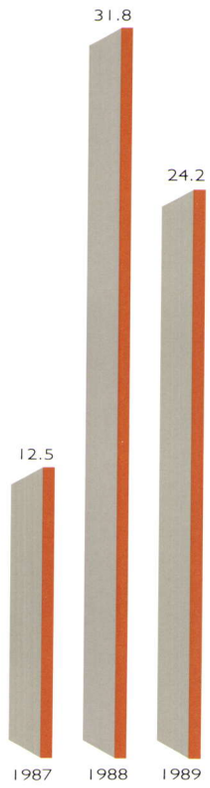
Dollar amounts in millions	1989	1988	Percent Change
For the year			
Net Sales[a]	$ 5,635	$ 5,539	+ 2
Operating profit	1,003	1,204	– 17
Net income	549	643	– 15
Capital expenditures	457	372	+ 23
Return on capital[b]	24.2%	31.8%	
At year-end			
Total assets	$ 4,068	$ 3,995	+ 2
Total debt	1,622	1,812	– 10
Net assets	1,209	890	+ 36
Total capital	2,877	2,748	+ 5
Debt/capital ratio	56.4%	65.9%	
Number of employees	17,078	16,362	+ 4

a Includes $22 million sales to affiliates in 1989 and $14 million in 1988.

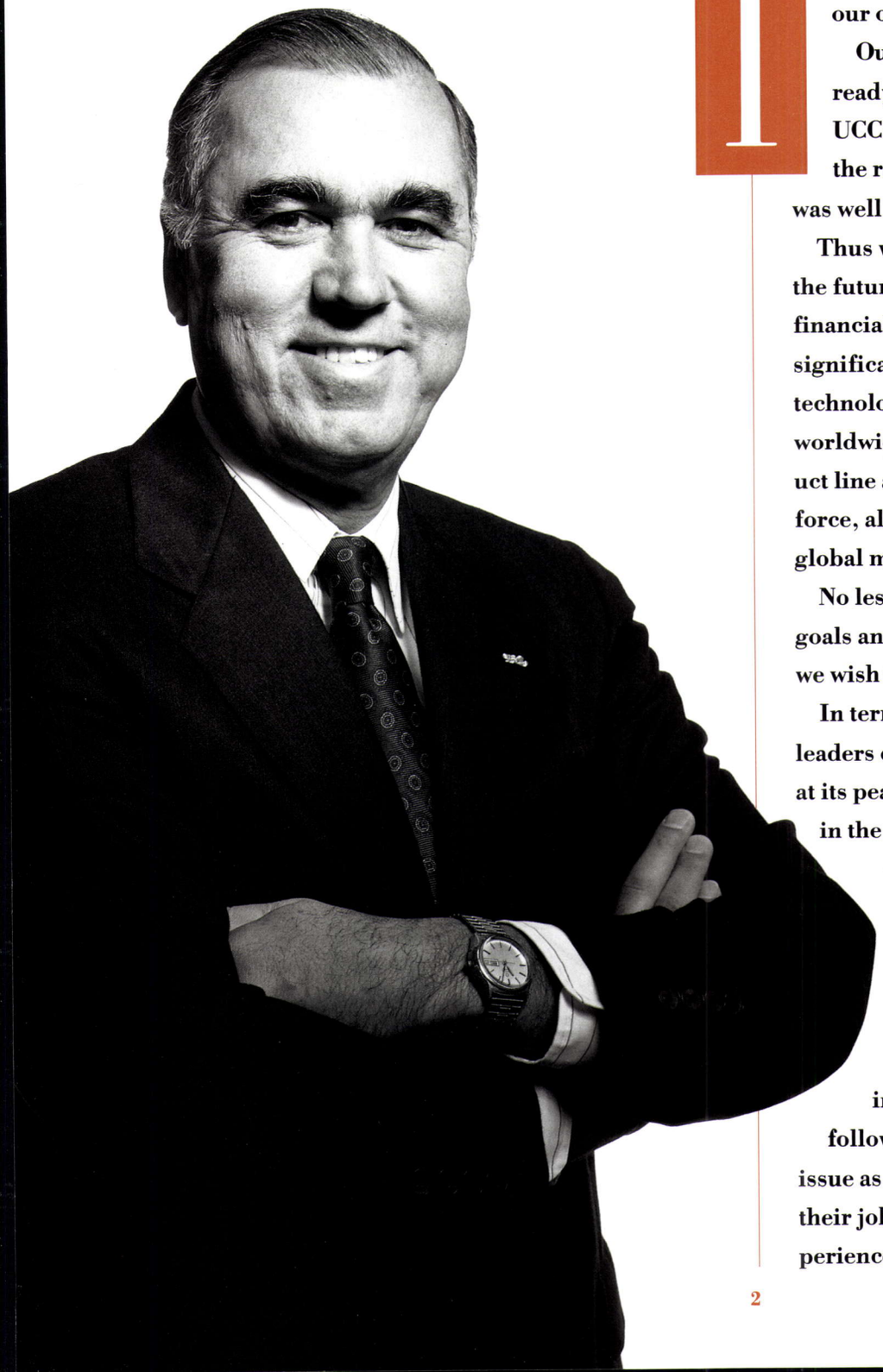
b After-tax operating profit divided by total capital. Total capital consists of net assets, total debt and minority stockholders' equity in combined entities.



NET SALES
(Millions of dollars)



RETURN ON CAPITAL
(In percent)



This is the first summary annual report of UCC&P, the worldwide chemicals and plastics business of Union Carbide. With the realignment of Union Carbide Corporation as a holding company, we are now a separate company. Our new status allows us more opportunity to shape our own future.

Our program of growth and renewal has already had a substantial impact on performance. UCC&P profitability in 1989, although below the record level attained in the previous year, was well above historical norms.

Thus we have good reason to be optimistic about the future. UCC&P enters the '90's in sound financial condition, with strong businesses and significant competitive strengths. These include technology leadership in major product areas, a worldwide customer base, a broad and diverse product line and a highly motivated worldwide work force, all of which are critically important in the new global marketplace.

No less important, we have well-defined business goals and a clear vision of the kind of organization we wish to create.

In terms of profitability, we performed among the leaders of our industry when the chemical cycle was at its peak and can now expect to perform far better in the current downturn than we did in previous ones. Our goal is better-than-average performance among comparable chemical companies regardless of business conditions. Getting there is partly a matter of strategic business management and operating efficiency, subjects covered in detail in the strategies and operations review that follows this letter. But it's a workplace issue as well, a question of how well Carbiders do their jobs and apply their considerable skills and experience. And we've made good strides toward creat-

ing a work environment that encourages their involvement and commitment.

Tying compensation more directly to the performance of our total business, a policy we introduced in 1989, is one element of the mix. Although precise measurement is difficult, we are confident that our people are more aware that they can make a difference, and that doing better for stockholders means doing better for themselves.

Carbiders are also responding to the new culture at our company, one that promotes change, welcomes ideas and backs initiatives that improve quality and deliver value to customers. Teamwork and results are what count from here on, and we are working hard to hasten the change.

Beyond that, we must be a company where good people feel they can grow personally and professionally. In the high-tech world of a modern chemical company, that takes continuous education and training. To help provide it, we have established a Continuing Education Center that offers employees a range of career and self-development courses centered on our *Excellence through Quality* program.

We retain our strong commitment to protect the environment and safeguard the health and safety of our people and our neighbors. Much has already been accomplished. In the past four years we've reduced potentially harmful air emissions from our plants by 45%, and since 1982 reduced by almost two-thirds the amount of hazardous solid waste that requires treatment or disposal.

Our near-term goal is to control emissions of potentially harmful chemicals so that potential exposure levels in the community are at least 1,000 times lower than mandated workplace standards. Ultimately, as the needed technology is developed, our aim is to completely eliminate air emissions and waste stream discharges of known and suspected carcinogens.

During the year, some 30,000 of our neighbors at manufacturing locations attended plant open-house gatherings to hear about our safety and environmental programs from the people who run the plants. We have also been an active participant in the Community Awareness and Emergency Response program of the Chemical Manufacturers Association (CMA).

And we have pledged our commitment to a new CMA initiative called *Responsible Care,* which requires members to manage chemical operations in a way that responds to public concerns. We believe that *Responsible Care* will lead to a better and safer chemical industry and help us regain the public acceptance any industry needs to grow and prosper.

We also believe that our status as a separate company requires a new affirmation of our responsibilities to our own people and to our customers. At the top of the list is a commitment to observe the highest standard of business ethics. That has always been Union Carbide's bedrock operating principle and will continue to be ours as well.

We are dedicated to creating a culture and environment in UCC&P that is externally focused toward our customers, and dedicated to serving their needs with high-quality, useful products. Only in that way will we meet our own needs for growth, profitability and good, secure jobs.

I am certain that UCC&P people are up to this task, and that we can make the most of the many promising business opportunities that will emerge in the '90's.

H. William Lichtenberger
President
February 28, 1990

Following a strong performance in 1987, the chemical industry entered a period of unprecedented prosperity. Returns were at record levels through 1988 and the first half of 1989, but as the cycle turned down during the second half of 1989, UCC&P's operating profit also began to decline.

Nevertheless, in terms of both business performance and positioning for profitable growth, 1989 was an excellent year for UCC&P. Sales of $5.635 billion set a record, and operating profit of $1.003 billion was higher than in any year except 1988.

The chemical downturn, which is likely to extend through 1990, will continue to affect our results. But our financial performance should rank high among comparable chemical companies during this period and beyond, due largely to a number of steps taken as far back as the early 1980's to improve returns. These included investment in our strongest businesses, divestiture of underachieving businesses and partial variabilization of certain fixed costs, which allows them to be more easily adjusted according to business conditions.

Our long-term business objectives are reflected in a carefully conceived four-part business strategy that directs our energies and resources toward creating value. We are confident that our strategic direction is right for the 1990's, and will therefore continue to:

- focus resources on worldwide businesses that have or can develop a sustainable competitive advantage;
- fund new business probes and ventures aimed at high-value-added market niches and specialty areas;
- support strong cash-generating businesses that although not technologically advantaged are nevertheless competitive; and

EXPANSIONS AND IMPROVEMENTS AT OUR 14 LATEX PLANTS HAVE STRENGTHENED OUR POSITION AS A LEADING SUPPLIER TO THE WORLDWIDE PAINT AND COATINGS INDUSTRY.

- **shut down or sell unprofitable businesses that are at a disadvantage compared with their competitors.**

As called for by our strategic plan, 1989 saw our resources focus mainly on several important businesses in which UCC&P has a clear competitive advantage: ethylene oxide/glycol, polyolefins, solvents and other chemicals and polymers for the coatings industry, and selected specialty chemicals and polymers.

UCC&P is the world's largest manufacturer of ethylene oxide/glycol. We also have the leading market share and operate what we believe are the lowest-cost manufacturing facilities in the industry.

OUR NEW LINE OF STRONG, *FLEXOMER* POLYMERS IS GAINING ACCEPTANCE FOR A RANGE OF APPLICATIONS FROM CAPPING LANDFILL SITES TO FOOD PACKAGING. ENGINEERS EXAMINE A *FLEXOMER* GEOMEMBRANE DESTINED TO LINE A STORAGE TUNNEL FOR JET AIRCRAFT.

Two-thirds of our ethylene oxide production goes to make ethylene glycol, used mainly for automotive antifreeze and for polyester, which in turn is used for fiber, film and molding resin applications. Although ethylene oxide is generally thought of as a

commodity business, the remaining one-third of our oxide production is converted into a broad range of high-value-added performance chemicals as well as commodity derivatives, including ethyleneamines, ethanolamines, glycol ethers, surfactants, CARBOWAX polyethylene glycol and POLYOX polyethyleneoxide.

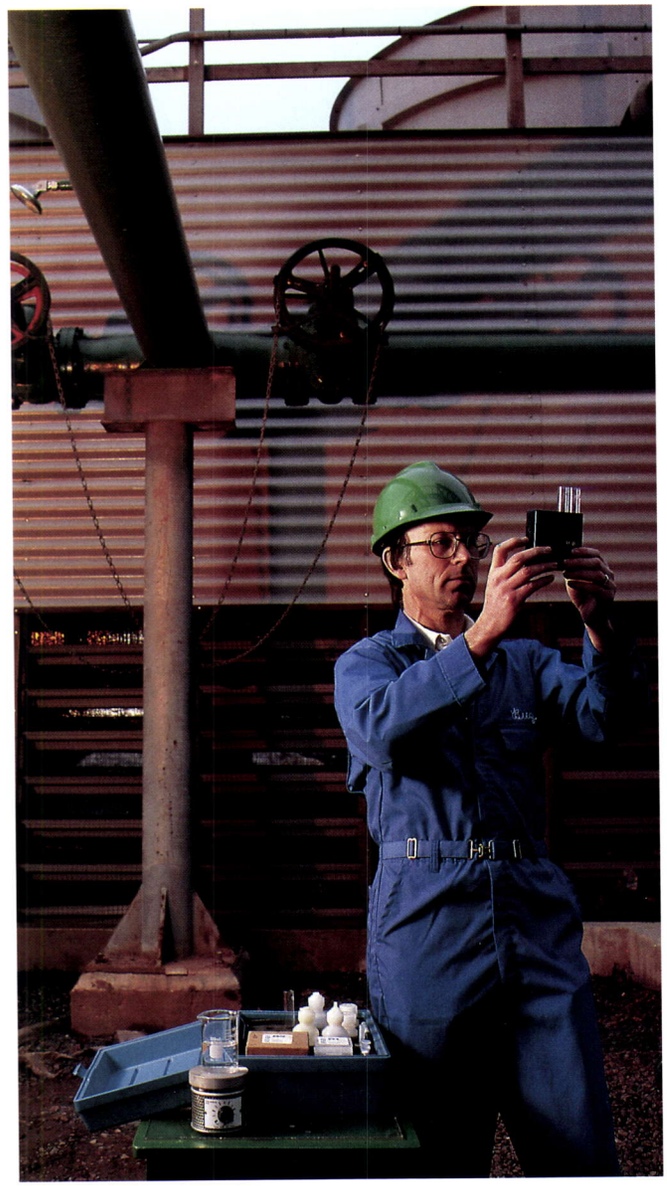
Despite sold-out operations during the first half of 1989, ethylene glycol volume declined during the latter part of the year, reflecting weak demand in the domestic antifreeze market and a sharp, short-term decline in export sales to Asia, where the political unrest in China affected markets for polyester fiber. Although the price of export glycol dropped sharply from record levels earlier in the year, margins remained above reinvestment levels.

To position ourselves for the 1990's, and for the firming of markets that we anticipate, we continue to address our options for major construction projects that would expand production of ethylene glycol.

In the United States, we have started work on the first phase of a major modernization and expansion of our ethylene oxide facilities at Taft, La. In Canada, a second world-scale, 480-million-pounds-per-year plant at Prentiss, in Alberta, is being planned. The new plant would double our existing capacity at that location and further strengthen our position as a leading supplier to the rapidly growing Asian polyester glycol market.

In September, we modernized and restarted a mothballed olefins cracker at Taft, at a cost of $80 million. This facility provides an additional 500 million pounds of ethylene capacity for less than half the cost of investment required to build a new cracker with equal capacity and will strengthen considerably the raw material position of our ethylene glycol and polyethylene operations.

In polyolefins, our competitive advantage stems from our leading-edge UNIPOL technology for the



A PORTABLE TESTING KIT DEVELOPED BY UCC&P HELPS CUSTOMERS MEASURE CONCENTRATIONS OF *AQUCAR* WATER TREATMENT MICROBIOCIDE, A PRODUCT WE SUPPLY TO CONTROL MICROBES IN WATER COOLING TOWERS.

production of polyethylene and polypropylene, and from a balanced portfolio of commodity and specialty businesses, strongly supported by a technology licensing program that generates significant income from virtually every important chemical production center in the world.

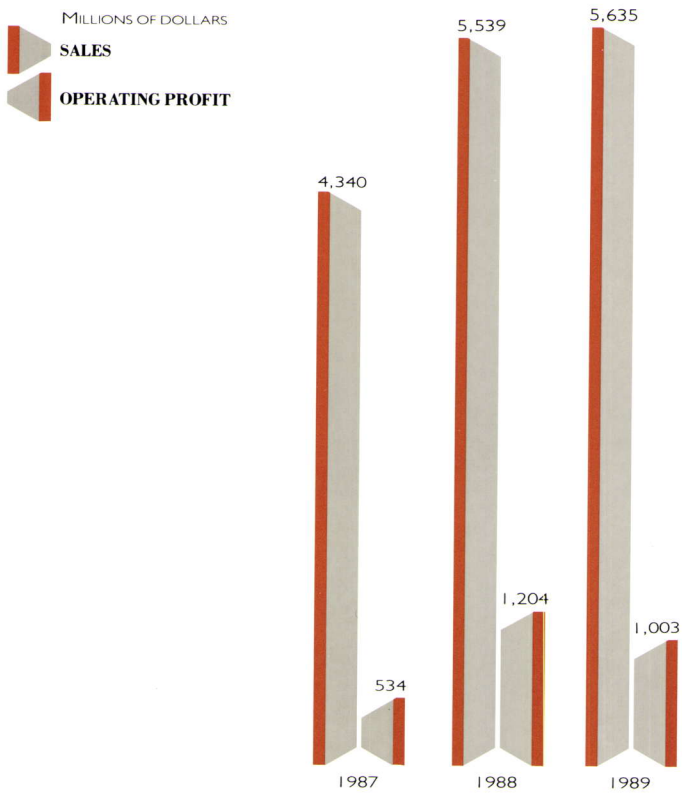
Our highly profitable wire and cable and other polyolefins specialties businesses, and our worldwide technology licensing business, assure us of a stable earnings base in good times and bad.

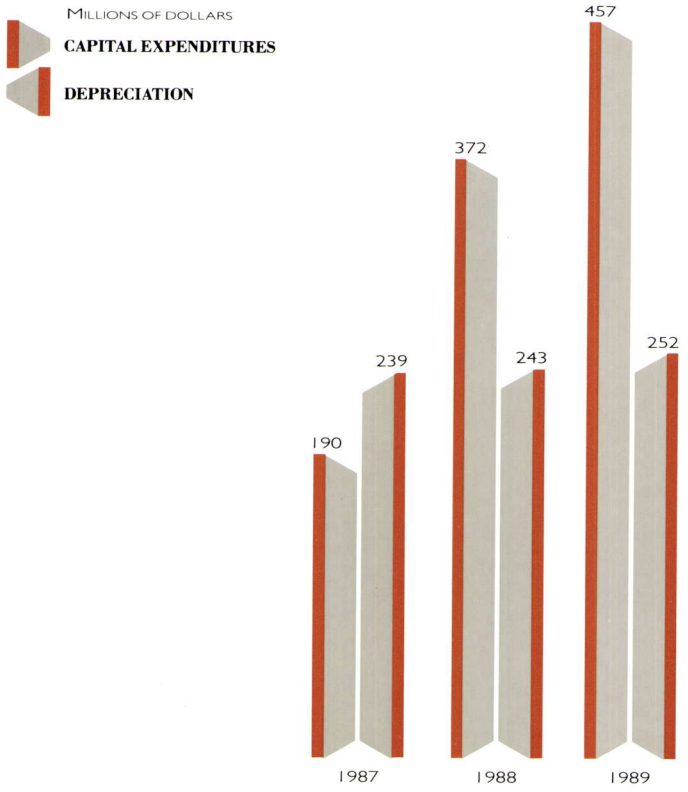
Polyethylene prices, which declined steadily from the latter part of 1988 through the first three quarters of 1989, began to firm toward the end of the year. Although margins eroded, demand remained strong and sales volumes in the fourth quarter attained record levels.

In September, start-up of the world's largest single-train polyethylene reactor at our Seadrift, Tex., plant capped a decade-long program of facilities renewal. The new 500-million-pounds-per-year UNIPOL process reactor, capable of producing the full range of polyethylene resins, brings our polyethylene capacity to 2.8 billion pounds per year and will ensure our ability to meet continuing strong market demand.

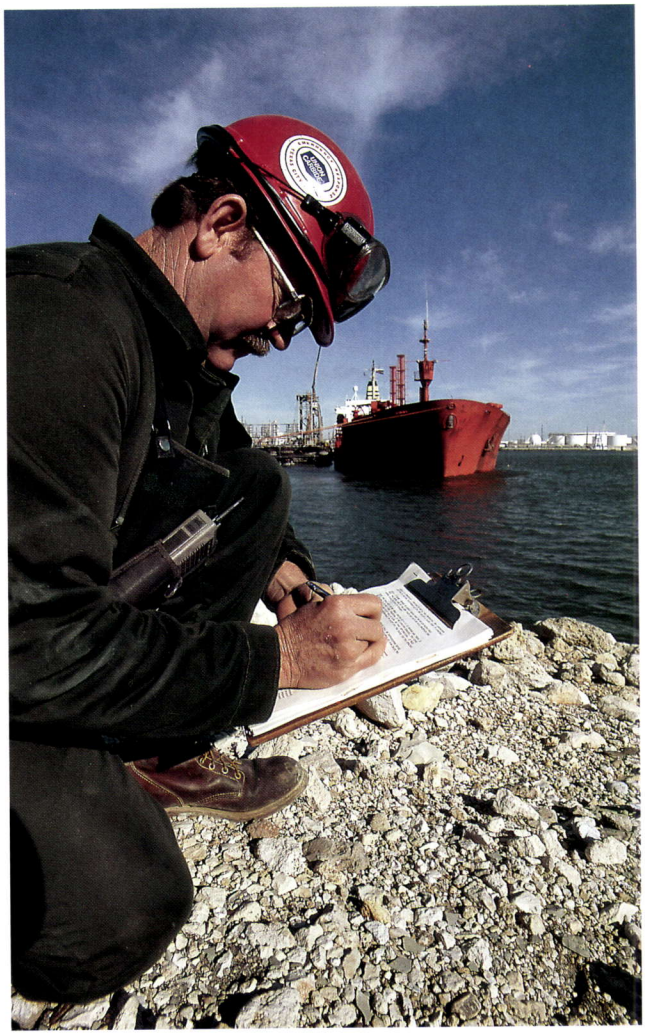
The move will also free up an older, smaller reactor for use in bringing new and improved products to the marketplace, including the company's new line of FLEXOMER polyolefin copolymers. These tough, flexible polymers, made by a process similar to the UNIPOL process for polyethylene, are generally more cost-effective than competing products.

UCC&P's Polyolefins Division also took steps to extend its lead as the world's foremost producer of insulation and jacketing compounds for the wire and cable industry. The division increased production capacity for vulcanizable insulation products by 30%, and is modernizing compounding facilities





A LOADING OPERATOR AT OUR TEXAS CITY, TEX., TERMINAL CHECKS ON A NEARLY LOADED NORWEGIAN TANKER TAKING CHEMICALS TO OVERSEAS CUSTOMERS.



for a promising line of flame-retardant wire and cable products.

At our Seadrift plant, construction continued on a state-of-the-art facility for producing semiconductive compounds. We also reentered Europe with our wire and cable compounds, looking toward growth that should stem from the integration of European markets beginning in 1992.

UNIPOL licensing efforts continued to gain momentum during the year, with four licensee plant start-ups in the United States, Europe and Asia and the signing of new polypropylene license agreements in Kuwait, Malaysia, Japan and the Philippines. Eight licensees with production already underway were moving ahead with plans to add UNIPOL process polyolefins capacity.

Another of our competitively advantaged businesses, solvents and coatings materials, strengthened its position as leading supplier to the coatings industry. In this business as well, our leadership stems from having a strong manufacturing base and the industry's leading technology—UCC&P's low-pressure oxo process, which, through licensing agreements, accounts for one-fourth of the world's oxo alcohol capacity. Our strong position is made even more secure by virtue of a highly professional sales force, strong customer relationships, a broad U.S. distribution network and worldwide trading capability.

To meet the growing demand for oxo alcohols, we completed a 200-million-pound incremental expansion of our oxo alcohol unit at Texas City, Tex., and, through Union Carbide do Brasil Ltda., reached agreement with Investimentos Itau S.A. (Itausa) of Brazil to form a joint venture to build and operate a 180-million-pounds-per-year plant in Brazil by 1992. The plant will manufacture oxo products for both Brazilian and international markets.

In other actions, we expanded our solution vinyl resin unit at Texas City and formed a joint venture with Sekisui America Corporation to market and eventually manufacture styrene/acrylic resins for toners used in copying and facsimile machines, a market with excellent growth potential.

To better serve the trade paint industry, operations were improved during the year at our six latex plants in the United States and Puerto Rico and at eight locations overseas. Three overseas plants—in Malaysia, Thailand and Indonesia—completed expansions during the year, and construction began on a new facility in the Philippines. Together, the four plants will boost our overseas latex capacity nearly 30% to 170 million pounds.

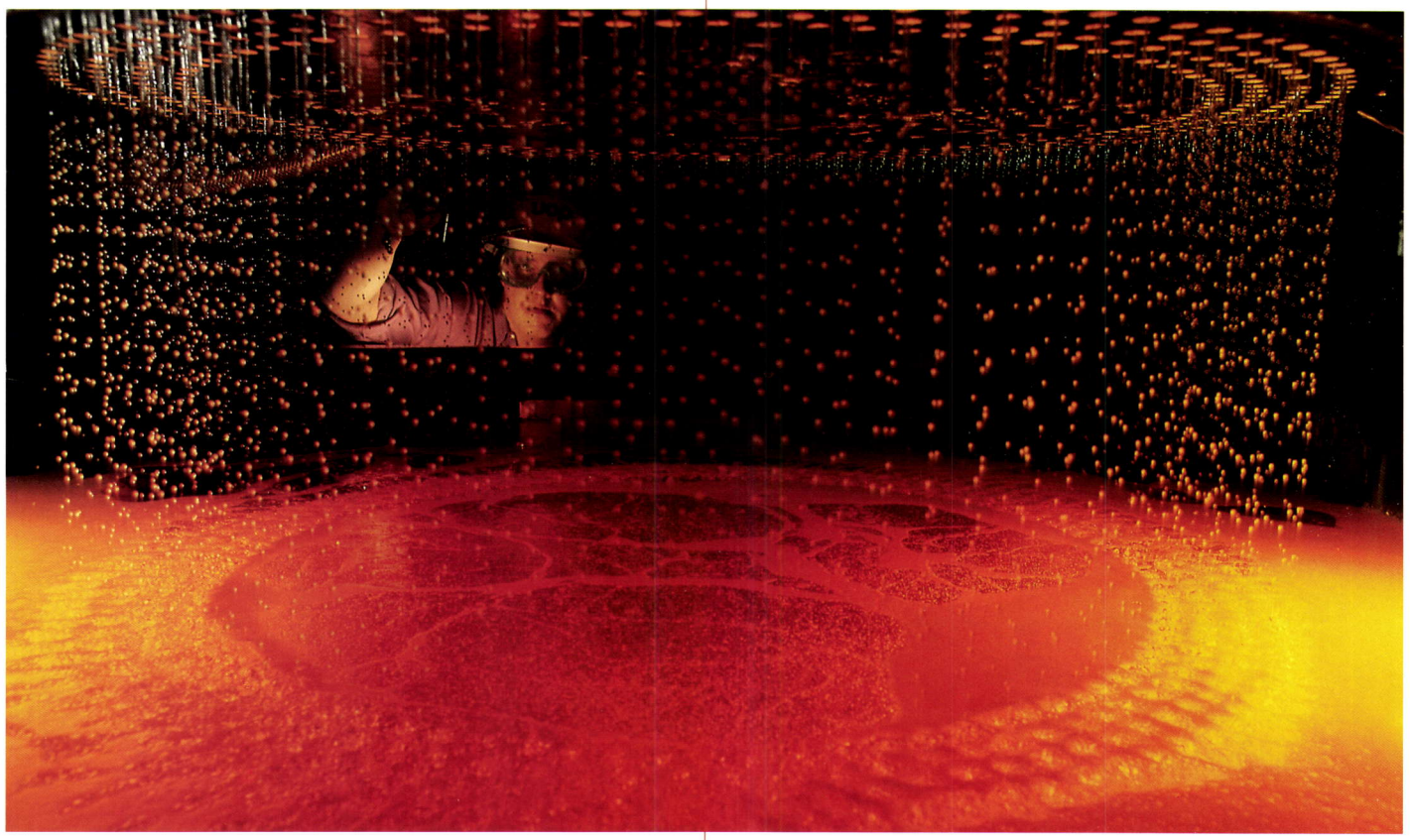
Of a number of technical achievements in 1989, the commercial introduction of a new technology that addresses an important environmental concern was among the most satisfying. The UNICARB system, now being licensed by UCC&P, is a unique technology that reduces volatile organic compounds in spray-applied coatings by 30% to over 70%, and enables applicators to comply economically with increasingly stringent clean air standards.

The past year also saw stepped-up activity aimed at strengthening our specialty chemical and other non-chain businesses—those whose products are not derived from ethylene or propylene—and gaining entrance to promising new niche markets through a number of expansions, acquisitions and joint ventures. Among the key developments:

- We announced plans to double our output of organosilicone products in Brazil by relocating production facilities to a new plant in Itatiba.
- We purchased BP Chemicals' silicone surfactants business, including its production facilities at Antwerp, Belgium, and Hythe, United Kingdom, and its research and development facilities at Meyrin, Switzerland.

ADDITIONAL OXO-ALCOHOL CAPACITY AT TEXAS CITY WILL HELP MEET THE COATINGS INDUSTRY'S GROWING NEEDS.

- **We entered a joint venture — Agri-Diagnostics Associates — that has developed processes for detecting diseases, contaminants and pollutants in agriculture, thereby expanding into a young and rapidly growing facet of the biosciences marketplace.**



UOP, OUR JOINT VENTURE WITH ALLIED-SIGNAL, RECORDED MORE THAN $700 MILLION IN SALES IN ITS FIRST FULL YEAR OF OPERATION. SPHERICAL CATALYSTS FOR THE REFINING INDUSTRY, MADE IN SHREVEPORT, LA., ARE AMONG UOP'S LINE OF HIGH-PERFORMANCE PRODUCTS.

- **We entered a joint venture with Baker Cummins Pharmaceuticals — known as Baker Cummins Dermatologicals — to develop and market health-care topicals (health-care products applied to the skin). The new venture will benefit from the same strengths in polymer science and technology that support UCC&P's growing business as a supplier of key performance chemicals to the personal care industry.**
- **And in its first full year of operation, UOP — formed in 1988 by joining an Allied-Signal subsidiary with Union Carbide's catalysts, adsorbents and process systems business — successfully**

combined process and materials science expertise to achieve sales of over $700 million. UOP is the leading supplier of catalysts, adsorbents, technology systems and services to the worldwide refining, petrochemical and gas processing industries. The company assisted in the start-up of more than 100 UOP-licensed process units in 29 countries during the year.

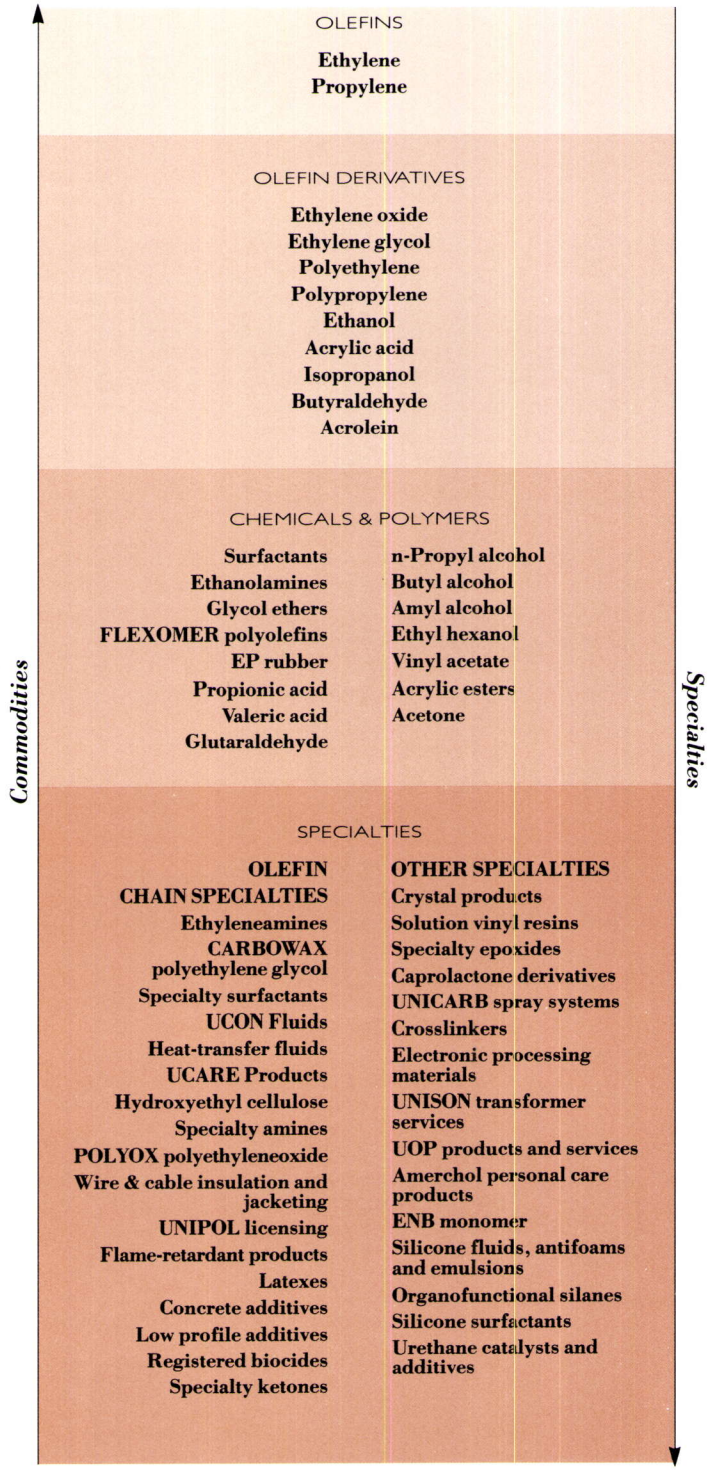
Global markets are becoming increasingly important for all of our businesses. Sales outside of North America—which account for a third of our business—grew by 12% in 1989, in virtually all product lines. To strengthen our presence overseas and capitalize on growth opportunities, we expanded our distribution facilities in Dubai, established a new technical service laboratory in Singapore and enlarged a laboratory in Switzerland to support the sale of specialty chemicals.

While most of our resources were being directed toward our strongest businesses in 1989, other businesses with poor prospects for attaining leadership were divested. In 1989 we announced the phasing out of our phenolic resin manufacturing facilities at Bound Brook, N.J., and reached an agreement to sell the urethane polyols and propylene glycols businesses of our Specialty Chemicals Division. Early in 1990, we signed a letter of intent with Komatsu Electronic Metals Co., Ltd. for the sale of UCC&P's polysilicon business. Over the past decade, UCC&P has shut down or divested underperforming assets with a book value of approximately $1.5 billion.

Complementing the steps we took to improve profitability in 1989 were significant improvements in UCC&P's health, safety and environmental performance.

There were improvements in all categories of environmental performance, including substantial reductions in process emissions and waste discharge.

CHEMICALS AND PLASTICS PRODUCT CHAIN



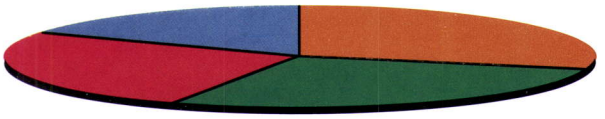
Important gains have also been made in an already outstanding workplace health and safety record. Our illness and lost-workday injury rate has been reduced 48% over the past two years.

Our *Excellence through Quality,* or "do it right the first time" effort, is now installed throughout all UCC&P worldwide operations and is beginning to pay dividends both in customer recognition and appreciation, and on the bottom line. Quality programs in 1989 resulted in significant cost avoidances and made an important contribution to manufacturing efficiency.

UCC&P has also implemented a company-wide Supplier Quality program in recognition of the fact that over 50 cents of every sales dollar is spent on purchased goods and services. The process makes the company's most important suppliers partners with us in the effort to achieve consistent top-quality performance. Suppliers capable of supporting the effort are awarded business and recognition; others who cannot are dropped.

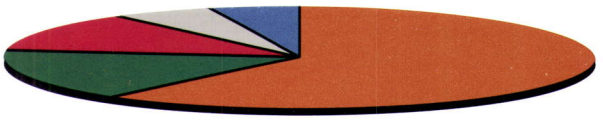
Summing up, we believe that UCC&P is more cost-efficient than ever, more attuned to customers, operating to higher standards of quality and better prepared than ever to operate profitably. The improvement stems partly from advanced technology and partly from having modern facilities. But as in any organization, the real key is people, and ours are bright, highly skilled and motivated, and dedicated to helping management increase the value of our company.

1989 Sales by Manufacturing Divisions
(Millions of dollars)



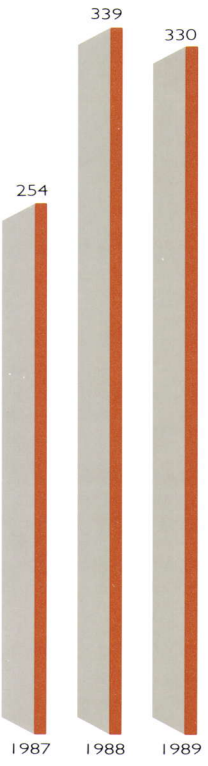
Polyolefins	$1,667	(30%)
Industrial chemicals	$1,538	(27%)
Solvents and coatings materials	$1,481	(26%)
Specialty chemicals	$ 949	(17%)

1989 Sales by Customer Location
(Millions of dollars)



United States & Puerto Rico	$3,426	(61%)
Far East & Other	$ 916	(16%)
Europe	$ 697	(12%)
Latin America	$ 318	(6%)
Canada	$ 278	(5%)

Sales per Employee
(Thousands of dollars)



INDUSTRIAL CHEMICALS
- Ethylene oxide/ glycol
- Ethylene oxide derivatives
- Crystal products

POLYOLEFINS
- Polyethylene
- Specialty polyolefins
- Fabricated plastic products
- UNIPOL polyethylene licensing
- UNIPOL polypropylene licensing
- Turnkey plant construction

SOLVENTS & COATINGS MATERIALS
- Alcohols
- Glycol ethers
- Ketones
- Esters
- Coating resins
- Latexes
- Acrylic monomers
- Vinyl acetate

INTERNATIONAL PETROCHEMICALS

Markets internationally a variety of chemicals and plastics produced by UCC&P and others.

SPECIALTY CHEMICALS
- Specialized chemicals
- Biocides
- Solvents
- Water-soluble polymers
- Silicones
- Personal care products
- Polyester modifiers
- Urethane foam intermediates
- Hydraulic fluids
- Synthetic lubricants
- Electronic processing materials
- UNISON transformer services
- Catalysts*
- Gas treating systems*
- Adsorbents*
- Molecular sieves*
- Hydrogen recovery/ purification*
- Acid gas removal*
- Hydrocarbon separations*
- Heat transfer*

*Products and services of UOP, a joint venture between subsidiaries of UCC&P and Allied-Signal Inc.

RAW MATERIALS AND MARKETS

We buy liquefied petroleum gas and naphtha and make ethylene and propylene. Along with purchased materials, the ethylene and propylene are used to make the following products: polyethylene for film, pipe, electrical insulation, wrap, bags, bottles and other products; ethylene oxide/glycol and derivatives used for antifreeze, polyester fiber, polyester film and resin, petroleum processing, coatings, lubricants, cosmetics and other uses; and alcohols and oxo-alcohols for coatings, preservatives, detergents and cosmetics. We make and buy other materials to produce acrylates and acetic esters for coatings, latexes, packaging and other products. From manufactured or purchased chemicals, we produce the following specialty chemicals: specialty glycol ethers, alkyl alkanolamines, acrolein, ethylidene norbornene, and polyvinyl acetate. These specialty chemicals are used in the cosmetics, microbiocides, electronics, automotive, aerospace, oil and gas, and industrial lubricant industries, and as chemical intermediates for pharmaceuticals and agricultural chemicals. Silicones are used in the manufacture of lubricants, electronics, pharmaceuticals, glass fiber and personal care products. Our crystal products business makes circuit substrates and laser rods. Our electronic processing materials business supplies the electronics and automotive industries.

The leading UCC&P end markets as a percent of sales are: film, molding and extrusion—21%; paints, coatings and adhesives—20%; textiles—10%; wire and cable—8%; automotive, including antifreeze—8%; chemical intermediates—6%; household and personal care products—5%.

Financial Index

This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0370006 Mine Name Rim-Columbus
Operator Denison Mines (USA) Date February 28, 1990
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Union Carbide Chemicals and Plastics
1989 Sumary Annual Report

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